REMARKS

The specification of the subject U.S. patent application, as filed, as constituted

by the verified translation of PCT/EP2005/050138, has been cancelled in favor of the

concurrently submitted Substitute Specification. A suitable Abstract of the Disclosure

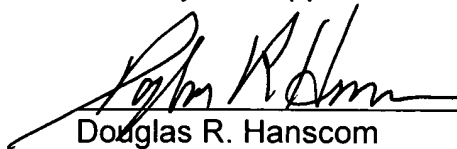has been added. These changes and additions do not constitute any new matter.

Original claims 1-26 have been cancelled. New claims 27-52 have been added.

New claims 27-52 are essentially the same, in scope, as the claims that are currently

pending in the corresponding PCT application. They had been rewritten more in a form

in accordance with U.S. practice and eliminating multiple dependencies.

Entry of this Preliminary Amendment into the file of the subject U.S. patent

application, prior to an examination of the application on the merits, and prior to the

calculation of the filing fee, is respectfully requested.

Respectfully submitted,

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[1]

MARKED-UP COPY OF SPECIFICATION
FISCHER ET AL., W1.2278 PCT-US

[Specification]

METHOD AND DEVICE FOR THREADING A WEB

CROSS-REFERENCE TO RELATED APPLICATIONS

[001]   This patent application is the U.S. national phase, under 35 USC 371, of PCT/EP2005/050138, filed January 14, 2005; published as WO 2005/075197 A1 on August 18, 2005, and claiming priority to DE 10 2004 006 232.3, filed February 9, 2004, the disclosures of which are expressly incorporated herein by reference.

FIELD OF THE INVENTION

[002]   The present invention is directed[relates] to a method and to a device for threading a material web[in accordance with the generic portion of Claims 1 and/or 17]. A threading device is conveyed along a threading path. The material web may be coupled to the threading device which is drivable by two spaced-apart drive motors.

BACKGROUND OF THE INVENTION

[003]   Devices for threading a web[of this type] are used in printing presses for conveying a leading end[the tail] of a material web along a[the] desired threading path through the printing press. This is necessary, for example, when threading in a web for use in a new production, or is always necessary whenever a material web has ripped during the printing process so[such] that the leading end[tail] of the new material web cannot be pulled through the press, in the performance[way] of a flying reel change.

Moreover, in modern printing presses, it is possible for the material to be printed to be moved along different web travel[supply] paths in order to achieve different printing results. In[such that, in] the case of a changeover of the printing press, to perform a different printing process, the new material web must be pulled along the appropriate threading or web feed path.

[004]   DE 94 15 859 U1 discloses a device for threading a material web into a treatment station. The[in which the] threading device[means], which is embodied as a belt, may be rewound from a first[one] winding roll, located at the intake point of the treatment station, to a second winding roll, located at the outlet from the treatment station. The two winding rolls each have one drive[each] in one preferred[exemplary] embodiment.

[005]   In one embodiment, DE 197 24 123 A1 discloses a noncontinuous threading device[means] that may be wound back and forth between two spool bodies, each of which is driven.

[006]   A device for threading material webs in rotary[rotation] printing presses is known from DE 22 41 127 A1. The[in which the] threading device[means], which is embodied as[in the manner of] a spring steel belt, may be conveyed through to the exit of the printing press along various threading paths, which path may be reconfigured[repositioned] by the use[means] of switch points. Here, the threading device[means] is driven by a driving wheel that is fixed in place, that engages in a positive manner[fit] with the threading device[means], and that pushes the threading

device[means] through the printing press along its entire length.

[007]   EP 04 18 903 A2 discloses a device for threading a material web. A[in which a] threading device[means] is driven by a motor that is regulated based on data which is measured during the threading process. The regulation process operates[works] to maintain a constant threading speed and/or a constant motor[engine] speed.

[008]   DE 94 09 390 U1 discloses a device for threading a material web in which a threading device[means] is driven by a multi-phase motor. A portion of a transport path, which[that] has already been travelled[covered] by the threading device.[means] is detected by the use[means] of sensors.

[009]   Devices for threading a material web are known from WO 02/090 650 A2. A discontinuous[in which a noncontinuous] threading device[means] is driven by a drive in the region of a delivery area for the material web. In a first embodiment[variation], this drive is regulated with regard to its speed, which may optionally be correlated with an independently driven aggregate speed of the machine. In a[, and in the] second embodiment, the drive[variation it] is regulated with respect[regard] to a torque.

SUMMARY OF THE INVENTION

[010]   The object of the present invention is directed to providing[create] a method and a device for threading a material web.

[011]   This object is attained by the provision of a threading device that can be conveyed along a threading path. A material web leading end is attachable to the threading device. The threading device is drivable by a first motor that is located in a

web receiving area, and by a second motor that is located in a web delivery area. The

first motor is controlled to run at a predetermined threading speed. The second motor is

controlled with respect to a torque on the motor, which may also be predetermined[the

features of claims 1 and/or 17].

[012] One advantage of the present invention lies in the fact that the machine, such as

a web-fed rotary printing press may be started up in a faster and more secure manner

after the threading process. The[Here, the] threading process occurs in a manner that

is very protective of the material being threaded, in spite of the ability to operate

at[possibility of] high threading speeds.

[013] In principle, the threading device[means] may be embodied in a continuous

fashion, such as, for example[i.e.,] as a closed, belt-shaped material, that may be

conveyed over a first[one] driven roll located in the region of a beginning of the

threading path and a second[one] driven roll located in the region of an end of the

threading path.

[014] However, it may also be[is] advantageous for the threading device[means] to be

embodied in a noncontinuous fashion, with each of its ends being disposed on a spool

or reel body such that it may be wound from a first[one] spool or reel body, in the region

of a beginning of the threading path, to a second spool or reel body in the region of the

end of the threading path. In so doing, however, both ends of the threading device

remain connected with their respective spool or reel body.

[015] In accordance with[According to] one preferred embodiment of the present

invention, the threading device[means] is driven by a first, driving[one] spool or reel body in the region of the beginning of the threading path and a second driving reel body[one] in the region of the end of the threading path. It is advantageous for these drives to be able to be drivable in two rotational directions for use in winding and unwinding the threading device[means].

[016] An adjustable electric motor is used to drive the spool or reel body which is located on at least the end of the threading path. The[such that the] spool or reel body may thus be driven, in a regulated manner, with various rotation speeds and/or motor[engine] speeds. Preferably, the drives of both spool bodies are embodied as being adjustable in terms of their motor[engine] speed and/or an[the] existing torque. By appropriate measurement of the infeed speed of the threading device, such as by[means] using measurement points or by a detection of the winding or unwinding angle on the spool body, the infeed speed of the threading device may be calculated and, by properly regulating the electric motor, a constant supply speed can be adjusted for the threading device[means]. By detecting an[the] existing torque, such as, for example[(e.g.], an electrical output[)], the existing torque may be determined. A[and a] certain torque may be maintained or a maximum torque may be monitored. Depending on the given requirements, the respective electric motor is then appropriately adjusted with regard to either a speed, such as, for example[(e.g.], a frequency[)] or motor[an engine] speed or [(]output[)].

[017] During the threading process, in one particularly advantageous embodiment of

the present invention, the drive in the region of the end of the threading path, such as,

for example[(e.g.], in the region of the superstructure[)] of the printing press, is

operated with the speed of the threading device or the electric motor[engine] speed

being regulated, while the drive in the region of the beginning of the threading path,

such as, for example[(e.g.], in the region of the reel changer[)] is operated with

respect[regard] to a torque, such as, for example[e.g.], to maintain a constant retaining

torque. In this manner, an even threading process is made possible and a particular

tension of the web is made certain[guaranteed] during the material web threading

process. This process, through the [(]regulation of both motor speed and torque,[)]

prevents so-called "bags" from forming in the web travel path, due to too low of a

tension, or prevent[and/or] a dancer roller, which may be located in the web travel path,

from being loaded with a too widely[strongly] deviating web tension. In the latter case,

when the printing machine was started, for example, extremely high deviations from

target values, and therefore high amplitudes of regulating systems would occur.

"Incorrect" web tensions in the startup phase, such as [(]too high tensions or too low

tensions, due to "bag" formation[)], could then easily lead to web tears, or at least to an

unnecessarily high amount of web distortion or maculation.

[018] In a further embodiment[development], the[this sort of] process and device for

threading a web, in accordance with the present invention are in an active connection to

a machine controller and/or to a web tension regulator, which is provided for operation.

In other words, simply by correctly threading the web, during the original installation of

the components[aggregates] that influence web tension, such as, for example[e.g.], the

dancer rolls, it is possible to provide[create] a machine that is ready for operation.

[019] In principle, the use of a plurality of sensors is conceivable for use in measuring

the supply speed of the threading device[means]. A particularly simple construction

results when the effective circumference of the spool or reel body, with which the

threading device[means] is unwound, as well as the rotational speed of the spool or reel

body is measured or is provided as a curve. The effective circumference of the spool or

reel body is understood as the value that results from adding the interior circumference

of the spool or reel body itself to the circumference of the layers of the threading device

which are[means] still wound on the reel body[thereon]. By evaluating these two

measured values, the linearly oriented feeding path and the time-dependent linearly

oriented feeding speed of the threading device[means] may be easily determined.

Subsequently[and, subsequently], by the use[means] of appropriate regulation, the

rotational speed of the spool body may be regulated to a target value. It is also

conceivable for a control curve, which can be provided in the supporting[underlying]

software, to contain the corresponding dependence of the target rotational speed on the

number of rotations of the reel body that have occurred.

BRIEF DESCRIPTION OF THE DRAWING

[020] One preferred[exemplary] embodiment of the present invention is shown in the

sole drawing figure and is described in greater detail in the following.

[021] The sole drawing shows a schematic side elevation view of a printing press with a device for use in threading a material web in accordance with the present invention[a schematically shown cross section].

DESCRIPTION OF THE PREFERRED EMBODIMENT

[022] In a web processing and/or finishing machine 01, such as, for example, in a printing press 01, for treating a web and/or material web, such as, for example, for printing on a paper web, a device is provided for threading a leading end[tail] of the web into the machine 01, by the use[means] of which device, a leading end[tail] of the web may be conveyed from a beginning of a web[the] threading path to an end of the web threading path. Optionally, either before or after this machine-fed path, a manual path may connect further through the machine.

[023] By way of example, the printing press 01, which is depicted[shown] only schematically in the sole drawing, includes[has] an assemblage[aggregate] 02, which is embodied as a printing unit 02, and depicted here with two double printing groups or four printing groups, as well as an assemblage[aggregate] 03, which is embodied as a reel changer 03, and a folding funnel or folding hopper assembly 04. Connected to the folding funnel 04 is [an aggregate 05 embodied as]a folding apparatus 05 that continues to process the material web. In operation, the material web, which is not specifically shown, runs from the reel changer 03 through one or more printing units 02, and then optionally is processed by the use[way] of a superstructure, which is not specifically shown and which is typically providing[, having] a longitudinal cutting device

and a _turning or_ reversing deck, _and is further processed_ by _the use_[way] of the folding

funnel 04. A device for threading the material web is provided in order to thread the

web mechanically onto at least one section of this _type_[sort] of _a material web_ path.

[024] In an advantageous first _preferred_ embodiment _of the present invention,_[in] a

frontal region of the machine_,_ in which a web _of material_ to be threaded may be

connected to a threading _device_[means] 06, _is_ referred to in the following _discussion_ as

the receiving area_. A_[, and in a] rear region _of the machine,_ in which the threaded web

is separated from the threading _device_[means] 06, _is_ referred to in the following

discussion as the delivery area_. The_[, the] device has one spool _or reel_ body 07; 08_, at_

each of the receiving area and the delivery area, and onto each of which _reel bodies 07;_

_08_ the threading _device_[means] 06 may be wound or unwound_,_ by _rotation of the_[said]

spool _or reel_ bodies.

[025] In an embodiment _which_[that] is not _specifically_ shown, the threading

device[means] 06 _may be_[is] continuous, _or_[i.e.,] embodied as a loop which, instead of

being wound on spool _or reel_ bodies 07; 08, circulates_,_ in the receiving area and the

delivery area _around_[of] a transport reel or roller. It is preferable for these transport

reels to be driven in the same manner as the spool _or reel_ bodies 07; 08, which are

described in greater detail below, i.e., regulated or controlled by rotational speed or

torque. In order to reduce slippage, _such transport reels or rollers_[they] may work

together with pressure rolls or rollers, for example.

[026] The receiving area is preferably located in the vicinity of the reel changer 03 such

that the web may be guided by the threading device[means] 06 directly after the

unwinding of the web from its reel at the changer reel. Fundamentally, the delivery area

may be disposed at any desired point along[of] the web travel path up to, and including

after[behind] the folding funnel 04. In the advantageous embodiment shown in the sole

drawing[here], the delivery area and thus the delivery area spool or reel body 07 is

disposed after the [(]last[)] printing unit 02 through which the web passes, but before the

folding funnel 04. If reversing rods are located in the superstructure, the delivery area

may optionally be located even before these reversing rods, if the guidance system for

the threading device[means] 06 and the web are not constructed for moving the web

around the reversing rods.

[027] It[However, it] is advantageous for the entire web to be threaded, in a straight

line, up to the folding funnel 04. Only[and only] after the[this] web has been threaded

should[for] the longitudinal web slitting blade[to] be placed in the superstructure and the

new partial web to be pulled over the reversing rods. Here, the delivery area is located

slightly before the entrance to the funnel.

[028] In the preferred[exemplary] embodiment shown in the sole drawing figure, the

spool or reel body 07 is driven in the delivery area by [means of]a drive having a single

motor 11, such as, for example, an electric motor 11, and in particular an alternating

current motor that may be regulated at least with regard to its [engine]speed. In a

simpler preferred embodiment, there is only one control by the use[means] of

which, a[the] target value $\acute{n}_{soll}$ for the motor[engine] speed or the frequency of the motor

11 is simply impressed into a control loop, without feedback. In an alternative

embodiment, the motor 11 is controlled in that, using a provided target value, an internal

control loop of the <u>motor</u> drive calculates a target value $\acute{n}_{soll}$ for the <u>motor</u>[engine] speed

or frequency, <u>so that</u>[i.e.,] the winding and unwinding speed of the threading

<u>device</u>[means] 06 is ultimately calculated by taking the winding radius <u>of the reel 07</u> into

account. Here, for example, an actual value of a measured angle speed, or <u>of</u> the

number of rotations per unit time of a component or a motor is sent back to a drive

regulator, which <u>drive</u> is not <u>specifically</u> shown.

[029] The target value $\acute{n}_{soll}$ for the <u>motor</u>[engine] speed and/or frequency that ultimately

represents the threading speed is given to the motor 11 or <u>to</u> its drive control by a

control device 12. This control device 12 has, for example, a frequency converter 13

and a control and/or calculation unit 14, <u>and</u> in particular <u>has</u> a servo control unit 14,

<u>which is</u> embodied as a Servo PLC 14, for example. With reference to a target value of

a given threading speed v_{soll}, logic integrated into the Servo PLC 14, [(]or <u>into</u> an

additional logical component[)], then calculates the target frequency and supplies it to

the motor 11 by way of the frequency converter 13. In a simple <u>preferred</u> embodiment,

the threading speed v_{soll} may be directly and manually provided to the control device 12,

<u>such as,</u> for example, by way of an input medium or <u>by</u> a corresponding interface on the

control device 12. In a preferred embodiment, the entry of the threading speed v_{soll} is

made by <u>the use</u>[way] of a higher-level control device 16, <u>such as,</u> for example, <u>by</u> a

machine control 16. This guarantees synchronization between the speed of movement

of the threading device[means] 06 and at least components or assemblies[aggregates] 02; 03; 05 of the printing press 01, which interact with the web to be threaded, such as, for example, by coming into physical contact with it.

[030]   By way of example, the sole drawing figure shows a rotary drive 17 for the printing unit 02 and/or a rotary drive 18 for the reel changer 03 and/or a rotary drive 20 of the folding apparatus 05 in electrical or other similar signal connection with[to] the machine control 16. The rotary drives 17; 18; 20 are preferably embodied to be mechanically independent from one another but are connected to one another electronically by way of the machine control 16. When a particular machine speed is entered, such as, for example, a particular threading speed for use in the threading operation is entered, the printing unit 02 and/or the reel changer 03 [(]and, optionally, other assemblies in the printing press 01[aggregates)] as well as the control device 12 of the device for threading the web receive speed-relevant target values that are correlated with each other and that guarantee synchronization of the speeds. For[, for] example, the unrolling speed at the reel changer 03 or the circumferential speed at the printing cylinder and the web speed are synchronized with each other.

[031]   The movement control of the subordinate drives 17; 18; 20, or [(]target value input[)], preferably follows a conductivity value of a so-called electronic guide axis Φ. The position of the guide axis Φ may either be oriented on one of the assemblies[aggregates] 02; 03; 05 of the printing press 01, such as, for example, on the folding apparatus 05, and may provide the input values to the remaining

assemblies[aggregates] 02; 03. Alternatively,[, or] the guide axis Φ may rotate freely,[–]

optionally depending on calibration on one of the assemblies[aggregates] 02; 03; 05,

such as, for example, on the folding apparatus 05,[–] and, in subsequent operation,

may supply the positions to all of the assemblies[aggregates] 02; 03; 05. A winding

speed of this rotating guide axis Φ then corresponds to a predetermined machine

speed, such as, for example, a setting for a "threading speed for automatic threading"

or a setting to print with a motor[an engine] speed or a product output that may be

predetermined. As a result, during the threading process, due to the machine control

16, [(]and/or due to the guide axis Φ[)], the movements of at least one moving

assembly[aggregate] 02; 03 that interacts with the web, such as, for example[(e.g.], the

printing unit 02 and/or the reel changer 03[)], and the threading device[means] 06 are

synchronized. The target value input of the threading speed v_{soll} into the control device

12 is preferably aimed at a selected machine speed.

[032] When the device is embodied with a threading device[means] 06 that is to be

wound and unwound, and with a drive to wind or unwind one or both spool or reel

bodies 07; 08, the changing winding radius of the reel body must be taken into account

when entering the target value $ṅ_{soll}$ into the motor 11. Although fundamentally, this

radius may be detected on a continual basis by arranging at least one sensor on the

spool or reel body 07; 08, the radius[it] is preferably calculated using the base diameter

of one or of both spool or reel bodies d07; d08, the number of winding layers or

rotations u_{0x} on one or both of the spool or reel bodies d07; d08 and the thickness d06

of the threading device[means] 06. If, with respect[regard] to a tension in the threading

device[means] 06 that must be maintained, a negligible lead must be provided in the

motor[engine] speed n_v, this must be added in as well. A current target value $\dot{n}_{soll}$ for

motor[an engine] speed may, in principle, be calculated using the following equation

[below]

$$\dot{n}_{soll} = \frac{v_{soll}}{\pi * \left(d0X + \left(2 * d06 * u_{0x}\right)\right)} + \dot{n}_v \, ,$$

where 0X = 07 or 08 and where, depending on the location of the arrangement of a

sensor 19, such as, for example, a resolver 19, detecting the number of rotations or

angular degrees that have been passed through, a transformation from one spool body

07; 08 to the other must occur.

[033] In the sole drawings figure, in order to count the number of rotations, the resolver

19 is shown in solid lines in the region of the spool or reel body 07 and in dashed lines

in the region of the spool or reel body 08.

[034] From the target value for the threading speed v_{soll}, the base diameter of one or of

both of the spool or reel bodies 07; 08, the number of winding layers or rotations u_{0x} on

one or on both of spool or reel bodies d07; d08 and the thickness d06 of the threading

14

device[means] 06, a corresponding signal for the motor 11, for use in keeping the

threading speed constant, is then generated in the control and/or calculation unit 14 and

in the frequency converter 13 and is sent to the motor. In a threading operation, the

motor 11 in the delivery area is thus regulated, by its motor[engine] speed, to maintain a

constant threading speed v. The expression d0X + (2*d06*u_{0x}) then represents a

current, calculated diameter D0X (D07, D08) after u_{0x} rotations.

[035] In contrast, a motor 21, such as, for example, an electric motor 21, and in

particular an asynchronous motor 21, driving the spool body 08 in the receiving area, is

driven during at least the threading operation [at least]in a torque-limiting manner. This

is accomplished using the servo control of the control and/or calculation unit 14. The

logic mentioned above for use in calculating a target frequency for the motor 11 as well

as for the servo control for the motor 21 may also be embodied in separate

components.

[036] In an advantageous operational mode of the present invention, a desired

tightening of the belt in the threading operation occurs by actuating the motor 21 in the

receiving area with a constant retaining momentum. In[; here, in] principle, the motor 21

runs in a[the] rotational direction which is opposite to the unwinding direction. However,

motor 21[it] becomes effectively forced to run in[into] the rotational direction for

unwinding by the force[means] of the stronger motor 11.

[037] In the threading operation, the threading device[means] 06 is thus pulled by the

motor 11 and the spool or reel body 07 in a circumferential speed-controlled manner

from the reel changer 03 to the delivery area [(e.g.], such as, for example to the folding

funnel 04[)], with the motor 11 being fed by the frequency converter 13 which, in turn,

receives a calculated target value $\acute{n}_{soll}$ for the frequency from the control and/or

calculation unit 14, which[that] depends on the current machine speed, [(]or on the

target value of the threading speed v_{soll}[)], and on the calculated diameter D07; D08 of

the spool body 07; 08 used for calculation. The motor 21 in the receiving area[(e.g.],

such as, for example near the reel changer 03[)], is actuated by the control and/or

calculation unit 14. In the threading mode, for example, motor 21[it] receives a low

offset engine speed in the direction opposite the unwinding direction. For example, by

adjusting a target tension value $Z_{soll,e}$ for the threading process, by the use[way] of an

input device to the drive, the torque may be limited. The motor 21 is "overtaken" by the

stronger, motor[engine] speed-controlled motor 11 and thus provides the desired belt

tension in the threading device 06.

[038] During[When] rewinding of the threading device 06, the delivery area motor 11

runs, for example, with an adjustable rewinding speed[(e.g.], such as, for example v =

26 m/min[)], and the drive motor 21 in the receiving area runs at an increased speed,

and at a constant torque in order to produce the belt tension. In such a rewinding

operation, the delivery area drive motor 11 receives its target frequency value, such as,

for example[i.e.], the target value $\acute{n}_{soll}$, corresponding to the currently calculated

diameter D07; D08 of the spool or reel bodies 07; 08 in the opposite direction. The

receiving area drive motor 21 receives an adjustable speed, which is evaluated with a

fixed diameter, such as, for example[e.g.], with a fixed diameter of 220 mm for the

empty drum. In addition, as in the threading process, it is preferable for an offset

engine speed to be added in order to ensure a constant lead on the delivery area drive

motor 11 and on its spool or reel body 07. By a constant lead of the spool or reel body

08 and by the provision of an adjustable target tension value $Z_{soll,r}$ for the rewinding

process, the desired belt tension is built up and maintained in rewinding operation.

[039] Maintaining a constant threading speed and, in particular, maintaining particular

torques when threading, allows the web to be threaded in a manner such that the web,

and the assemblies[aggregates] that influence the web tension reach, a state

which[that] already approximates the conditions required for starting the printing

press[machine] 01. This is shown in the sole drawing figure by the example of a[an

implied] dancer roller 22 which is circumscribed by the threading device 06[means].

When the machine 01, which is embodied as a printing press 01, is in operation, the

dancer roller 22 corrects an existing web tension, with respect[regard] to a selectable,

constant web tension. This constant web tension may, for example, be provided and

regulated by a web tension regulator, [(]which here is integrated into the machine

control 16[)]. Once the target value has been appropriately adjusted during the

threading process, and the torque on the threading device[means] 06 has been

maintained, threading is now possible without bag or web sag formation and/or without

an undesired deflection of the dancer roller 22 occurring. This means that the threading

process [already]occurs with approximately correct path lengths and tensions. When

[, so that when] the <u>printing press</u>[machine] 01 is started up later <u>for production</u>

<u>operation</u>, the danger of web tears or <u>of</u> protracted fluctuations in regulation are

reduced. In a further development of the <u>present</u> invention, a regulation of the web

tension <u>may have</u>[has] already been activated during the <u>web</u> threading process.

[040] <u>While a preferred embodiment of a method and device for threading a web, in</u>

<u>accordance with the present invention has been fully and completely described</u>

<u>hereinabove, it will be apparent to one of skill in the art that various changes in, for</u>

<u>example the specific structure of the threading device, the specific nature of the sensors</u>

<u>and the like could be made without departing from the true spirit and scope of the</u>

<u>present invention which is accordingly to be limited only by the appended claims.</u>

<u>WHAT IS CLAIMED IS:</u>

[List of Reference Characters

01	Machine, printing press
02	Printing unit, aggregate
03	Reel changer, aggregate
04	Folding funnel
05	Folding apparatus, aggregate
06	Threading means
07	Spool body
08	Spool body
09	--
10	--
11	Motor, electric motor, alternating current motor
12	Control device
13	Frequency converter
14	Control and/or calculation unit, servo control unit, Servo PLC
15	--
16	Control unit, higher-level; machine control
17	Drive
18	Drive
19	Sensor, resolver
19'	Sensor, resolver
20	Drive
21	Motor, electric motor, asynchronous motor
22	Dancer roller

$\acute{n}_{soll}$	Target value
v_{soll}	Threading speed
Φ	Guide axis, electronic]